

## Optics Review

### Key Terms:

Incandescence	Fluorescence	Luminescence	Phosphorescence
Chemiluminescence	Bioluminescence	wavelength	reflection
medium	ray	incident ray	reflected ray
angle of incidence	angle of reflections	normal	plane mirror
concave	convex	principal axis	focal point
focal length			

Apart from the key terms above, you should know the following from chapter 10

### From Chapter 10.1

- know all the different types of light
- know how electric discharge works
- understand the process of how an excited atom produces light (electron jumping up a shell)
- know light is an electromagnetic wave and how we can only see certain wavelengths

### From Chapter 10.2

- know that light travels in a straight line called a ray
- know how to use rays and the law of reflection to draw an image using ray diagrams
- know the four characteristics of images (location, orientation, size and type)
- know the difference between virtual image and a real image

### From Chapter 10.3 and 10.4

- know how to draw ray diagrams to determine where the image is in curved mirrors
- know how to use the mirror equation
- know how to use the magnification equation

### Equations:

#### Mirror Equation:

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$

#### Magnification Equation:

$$m = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$$

Key Terms:

refraction	refracted ray	angle of refraction	index of refraction
partial reflection and refraction		critical angle	total internal reflection
rainbow	apparent depth	shimmering	mirage
Temperature Inversion			

Apart from the key terms above, you should know the following from chapter 11

From Chapter 11.1

- know what refraction is
- know how the speed of light in a medium causes it to bend (including which way it bends)
- know Fermat's Principle
- know how to use the index of refraction

From Chapter 11.2

- know what is different about light going from a slow medium to a fast medium
- know how to calculate the critical angle
- know how to describe total internal reflection and when it occurs
- know the uses discussed in this section about internal reflection

From Chapter 11.3

- know how a rainbow is produced (be able to draw the diagram)
- know how apparent depth influences what we see
- know how changes in the temperature of water results in shimmering, mirages and temperature inversions

Equations:

index of refraction:

$$n = \frac{c}{v} \quad c = 3.0 \times 10^8 \text{ m/s}$$

Key Terms:

lens	converging lens	diverging lens	spherical aberration
chromatic aberration	objective lens	eyepiece	cornea
retina	myopia	hyperopia	presbyopia
astigmatism	night-vision		

Apart from the key terms above, you should know the following from chapter 11

From Chapter 12.1

- know what a lens is
- know the difference between converging and diverging lenses
- know spherical and chromatic aberration

From Chapter 12.2

- know how to draw ray diagrams of converging lenses and diverging lenses
- know how to use the thin lens and magnification equations

From Chapter 12.3

- know how telescopes and microscopes work
- know how the human eye works
- know the different names for poor vision and why they occur
- know how night vision goggles work

Equations:

Thin Lens Equation:

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$

Magnification Equation:

$$m = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$$

Recommended Equations

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